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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/534,207	03/24/2000	Makoto Kashiwaya	Q55902	2981

7590 08/28/2003  
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EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/534,207

Applicant(s)

KASHIWAYA ET AL.

Examiner

DuyVu n Deo

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-12 is/are rejected.
- 7) ☒ Claim(s) 7 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (US 4,816,113) and Kitsunai et al. (US 6,186,153).

Yamazaki teaches a method for forming a carbon layer by vapor phase deposition comprising steps of: cleaning the apparatus by removing undesirable products such as carbon deposition from the inside of the chamber (in between the carbon deposition or this would mean the cleaning is performed before another deposition); the chamber is then evacuated to  $1 \times 10^{-6}$  Torr or a higher vacuum condition (this would further remove any floating particles within the chamber); starting a film deposition process of the carbon (col. 5, line 41-col. 6, line 2; col. 3, line 41-col. 4, line 2). Unlike claimed invention, Yamazaki doesn't describe adjusting the content of particles having a particle size of 0.5  $\mu\text{m}$  or more to 1000 particles/ $\text{ft}^3/\text{min}$  or less (such as 500 or 100 particles/ $\text{ft}^3/\text{min}$ ). However, to have a clean chamber before any deposition process is a well-known step to one skilled in the art as shown by Yamazaki's cleaning step. Also as shown here by Kitsunai where he teaches of cleaning any possible dust or contamination from the chamber so that they do not cause defects on the devices being manufactured (col. 1, line 14-40; col.2 line 40-47). Therefore, it would have been obvious at the time of the invention for one skilled in the art to removed any dust, particles, which would includes any particles

having size of 0.5 um or more, so that they do not cause defects on the devices being manufactured.

Referring to claim 3, the application of deposition of carbon layer as a protective layer on a thermal head performing thermal recording is known to one skill in the art as described in the background of the specification.

Referring to claims 5 and 6, forming a thermal head having a 3 protective layers including a lower, intermediate, and carbon layer are well known to one skill in the art as described in page 8 of the specification. The thickness of each layer would have been obvious to determined through test runs in order to provide optimum thickness of each layer for protection of the thermal head with an anticipation of an expected result.

3. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki and Kitsunai as applied to claim 1 above, and further in view of Kao et al. (US 6,026,762).

Unlike claimed invention, applied prior art above doesn't describe cleaning the chamber using dust cloth. However, using a cloth to clean a deposition chamber is well known to one skill in the art as shown here by Kao (col. 2, line 25-33; col. 16, line 7-13). It would have been obvious for one skill in the art at the time of the invention in light of Kao to clean the depositing chamber with a cloth because Kao teaches that it would remove the impurities build up in the CVD, improve device yield and better product performance (col. 2, line 25-33).

***Allowable Subject Matter***

4. Claims 7 and 8 remained allowable.

***Response to Arguments***

5. Applicant's arguments filed 6/27/03 have been fully considered but they are not persuasive.

Applicant's argument that Kitsunai doesn't describe the size and content of the dust being removed from the chamber is acknowledged. However, he suggests to clean any possible dust or contamination from the chamber, this would include removing anything of any size or content of dust or contamination that is not desired in the first place including claimed of particle size of 0.5 um or more and 1000 cfm or less.

Referring to applicant's argument that one skill in the art, in light of Kitsunai, would not have recognized to adjust the content of particles having a particle size of 0.5 um or more to 100cfm or less. The claimed range is obviously the most general range that one skill in the art would prefer when to clean the chamber. For example, the removal of a big size contamination such as claimed a particle size of 0.5 um or more is obvious because no skill in the art would prefer to clean small-size dust or contamination and yet leaving big size contamination. Furthermore, when cleaning, the more contamination being removed the better for the next processing step, such as claimed adjusting the content of the particle to 1000 cfm or less. It would be desired by one skill in the art in light of Kisunai to have 0 cfm in any step.

Referring to applicant's argument that Kitsunai does not disclose specific numerical values for the electromagnetic waver, the claims do not require any of specific numerical values for electromagnetic wave.

Referring to applicant's argument that the thickness is not a result-effective variable therefore can't be determined through routine experimentation, the fact that there is a range for the thickness suggests that the thickness is a result-effective variable and must be determined through routine experimentation to obtain optimum thickness. If it were not a result-effective variable then there would not be any preferred range for the thickness.

### ***Claim Objections***

6. Claims 9 and 10 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 9 recites a broader range of particles content than claim 1.

Claim 10 recites the same range as that of claim 1; therefore, they are not further limiting the subject matter of claim 1.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD

August 21, 2003

NADINE G. NORTON  
PRIMARY EXAMINER

